NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

AGENCY: National Aeronautics and Space Administration (NASA)

NOTICE: (21-003)

ACTION: Notice of Deep Space Food Challenge Phase 1

SUMMARY: Phase 1 of the Deep Space Food Challenge is open, and teams that wish to compete may now register. Centennial Challenges, part of the NASA Space Technology Mission Directorate's Prizes, Challenges, and Crowdsourcing Program, consist of prize competitions to stimulate innovation in technologies of interest and value to NASA and the nation. Phase 1 of the Deep Space Food Challenge is a prize competition with a total prize purse made up of $500,000 USD, (five hundred thousand United States dollars) to be awarded to competitor teams for the design of novel technologies, systems and approaches for food production for long duration space exploration missions. NASA is providing the prize purse for U.S. teams, and the Methuselah Foundation will be conducting the Challenge on behalf of NASA. NASA is considering a Phase 2 (system demonstration phase) of the competition depending on the outcome of the Phase 1 competition.

DATES: Challenge registration for Phase 1 opened January 12, 2021, and will remain open until the deadlines stated below. No further requests for registration will be accepted after the stated deadline.

Other important dates:

May 28, 2021	Phase 1 Registration Closes for U.S. & Non-Canadian International Teams
July 30, 2021	Submissions Due for all Teams
September 2021	Winner(s) Announced

ADDRESSES:

Phase 1 of the Deep Space Food Challenge will be conducted virtually. The Challenge competitors will develop and submit their design proposals from their own location.

FOR FURTHER INFORMATION:

To register for or get additional information regarding the Deep Space Food Challenge, please visit:

www.deepspacefoodchallenge.org

For general information on NASA Centennial Challenges please visit: http://www.nasa.gov/challenges. General questions and comments regarding the program should be addressed to Monsi Roman, Centennial Challenges Program Manager, NASA Marshall Space Flight Center Huntsville, AL 35812. Email address: hq-stmd-centennialchallenges@mail.nasa.gov

For general information on the Canadian Space Agency please visit: https://www.canada.ca/en/space-agency.html General questions and comments regarding the program should be addressed to ASC.DefiAEL-DSFChallenge.CSA@canada.ca

SUPPLEMENTARY INFORMATION:

Summary

Food is a critical component of human space exploration missions. When humans return to the lunar surface, the early missions are expected to use prepackaged foods similar to those in use on the International Space Station (ISS) today, but extending the duration of lunar missions requires reducing resupply dependency on Earth. Thus, testing a sustainable system on the Moon that meets lunar crews' needs is a fundamental step for both lunar sustainability and will also support Mars exploration. As part of this, space agencies are focused on how to furnish crew members with a viable system that produces food for all long duration space missions. The food system will need to be an integrated solution that:

- Provides all daily nutritional needs
- Provides a variety of palatable and safe food choices
- Enables acceptable, safe, and quick preparation methods
- Limits resource requirements with no dependency on direct periodic resupply from Earth over durations increasing from months to years

In short, space agencies will need to provide their future crew members with nutritious foods they will enjoy eating within all of the constraints of current technology for life away from Earth. They must also ensure that the process to create, grow, and/or prepare the food is not time consuming and not unpleasant. Although there are many food systems on Earth that may offer benefits to space travelers, the ability of these systems to meet spaceflight demands has not yet been established.

Additionally, food insecurity is a significant chronic problem on Earth in urban, rural and harsh environments and communities. In places like the Arctic and Canada's North, the cost of providing fresh produce on the shelves can be incredibly high. This can also support greater food production in other milder environments, including major urban centers where vertical farming, urban agriculture and other novel food production techniques can play a more significant role.

Disasters can also disrupt supply chains, on which all people depend, and further aggravate food shortages. Developing compact and innovative advanced food system solutions can further enhance local production and reduce food supply chain challenges, providing new solutions for humanitarian responses to floods and droughts, and new technologies for rapid deployment following disasters.

The Deep Space Food Challenge will identify technology solutions that can:

- Help fill food gaps for a three-year round-trip mission with no resupply
- Feed a crew of four (4)
- Improve the accessibility of food on Earth, in particular, via production directly in urban centers and in remote and harsh environments
- Achieve the greatest amount of food output with minimal inputs and minimal waste
- Create a variety of palatable, nutritious, and safe foods that requires little processing time for crew members

This Challenge seeks to incentivize Teams to develop novel technologies, systems and/or approaches for food production that need not meet the full nutritional requirements of future crews, but can contribute significantly to and be integrated into a comprehensive food system.

I. Prize Amounts

Up to 20 top scoring U.S. Teams that achieve a score in five or more of the scoring categories will receive $25,000 USD each from NASA and be invited to compete in Phase 2 (should Phase 2 open for competition). Teams must meet the eligibility requirements for the NASA Prize in order to be eligible to receive a prize from NASA.

II. Eligibility to Participate and Win Prize Money

To be eligible to win a prize, competitors must register and comply with all requirements in the Official Rules. Interested Teams should refer to the official Challenge website (www.deepspacefoodchallenge.org) for full details on eligibility and registration.

III. Official Rules

The complete official rules for the Deep Space Food Challenge can be found at:

www.deepspacefoodchallenge.org

Nanette Smith

NASA Federal Register Liaison Officer

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